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Newport, R.I.**

**PRINCIPLES OF INFORMATION MANAGEMENT FOR THE OPERATIONAL
COMMANDER**

by

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**A paper submitted to the Faculty of the Naval War College in partial satisfaction of
the requirements of the Department of Joint Military Operations.**

**The contents of this paper reflect my own personal views and are not necessarily
endorsed by the Naval War College or the Department of the Navy.**

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Abstract

PRINCIPLES OF INFORMATION MANAGEMENT FOR THE OPERATIONAL COMMANDER by Lieutenant Samaria Hunter, USN, 16 pages.

The vast amount of information available in today's network centric environment has increased the complexity and uncertainty of military operations. Leveraging the information domain to achieve a decisive advantage requires effective information management. In a globally connected world, where unilateral nation-state military operations are becoming less likely, mission success in the operational environment will largely depend on the interoperability of many diverse organizations. Information flow is the critical link that ties these organizations together and achieves unity of effort. However, information management at the operational level is less than optimum. With so much depending on the ability to get the right information to the right people at the right time, an effective information management strategy is a must. This paper will analyze the impact of information management missteps in past and current operations and show that fundamental tenets can be derived to effectively guide information management in the operational environment.

INTRODUCTION

“Information has always been a source of power, but the information age is making it increasingly a source of confusion.”¹

There is no denying the vital role of the information domain in military operations or the continuous flow of information it provides. The challenge of handling the vast quantities of information available in today’s network centric environment can be overwhelming in any business. But add the high operational tempo and uncertainties of military operations, along with the requirement of speedy decisions to stay ahead of the enemy and the challenges grow exponentially. Providing the right information - accurate and relevant - at the right time can prove to be extremely complicated.

As the Chairman says, “The transformation of the joint force to reach full spectrum dominance rests upon information superiority as a key enabler.”² However, the information superiority envisioned cannot be realized until the right information can be effectively captured, analyzed, disseminated, and leveraged to meet operational objectives. With so much attention focused on the significance of information operations³ in achieving information superiority, one might assume the importance of how information is handled within the organization has been diminished. Nothing could be further from the truth. Information superiority is not solely dependent on Information Operations as JV 2020 appears to favor or clearly emphasizes, but is also “the operational advantage derived from the ability to collect, process, and disseminate an uninterrupted flow of information”.⁴ Simply put - information management (IM). If joint forces are to achieve full spectrum dominance, effective IM must be the foundation on which information superiority is built.

Information provides enhanced awareness, so it seems only logical that the more information available, the less confusion in the operational environment. So why then in a globally networked environment has information become a source of uncertainty? It is easy to blame the confusion on the sheer volumes of information. However, the lack of an overarching operational strategy for IM is likely at fault.

In complex environments, guiding principles are often used to steer the actions of organizations toward a desired objective. Generally based on tough lessons learned, these principles are basic underlying assumptions meant to prevent or at least diminish the likelihood of repeating past mistakes. Often devised for complicated processes, principles are not meant to direct action but provide key points of consideration in planning for execution. In the military, if a subject matter is deemed important, it is given legitimacy through strategies or principles. The granddaddy of them all, the principles of war are considered to be “capsules of wisdom”⁵ which “represent fundamental truths in the practice of military art that have stood the test of time.”⁶ Others include the principles of logistics⁷, principles of military operations other than war⁸, principles of ethical conduct⁹ and of course, the principles of information operations.¹⁰ All of which are critical processes in achieving military objectives-IM is no less significant. The knowledge that is shared through IM underlies all military operations.

IM at the operational level is less than optimum. Are there basic IM principles that can be derived from lessons of past and current operations? Principles that can guide the commander and operational staff in developing an effective IM strategy to increase the

likelihood of having the right information at the right time? This paper will show that there are fundamental tenets that can effectively guide IM in the operational environment.

ANALYSIS

“The operational level of command is normally established only in time of regional conflict.”¹¹ That alone adds increased complexity to the environment. When bringing together large numbers of people, processes, and systems, seamless operations are nearly impossible unless the organizations have been organized, trained, and equipped to operate in that manner. Understandably, each organization involved in the operation has its own information requirements and processes it brings with it to the fight.

Unfortunately, mission success is not achieved through autonomous operations but relies heavily on the integration of operational units - joint, coalition, multinational forces, IGOs¹², and NGOs¹³ - working collectively as a well-oiled machine. Information flow is the critical link that ties these diverse organizations together and achieves unity of effort. However, IM in a theater of operations seems to be more a makeshift effort than a planned approach. “As joint operations cease to be the exception and become the rule, the challenge for both military and industry leaders is to help define and deliver those capabilities....that exchange information in a seamless and transparent manner.”¹⁴ While it is impossible to analyze and include all instances of IM missteps that add to the perplexity of the operational environment, below is the analysis of three operations to prove the point and the logical conclusions extracted from each. Due to space limitations, beneficial IM practices extracted from each of the operations are included in an Appendix.

Operation Provide Comfort

Shortly after the coalition's swift victory in Operation Desert Storm, the Kurds, knowing that Saddam Hussein's regime was weakened, revolted. However, they underestimated the ability of the post-war Iraqi Army.¹⁵ The Iraqi Army made quick work of the insurgency, viciously repressing the Kurds.¹⁶ Out of fear for their lives over one million Kurds, who were largely located in Northern Iraq, fled to Iran and the mountains of Turkey.¹⁷ United Nations (UN) Security Council Resolution 688 condemned the Iraqi repression of its people. Operation Provide Comfort was initiated with an immediate objective to provide humanitarian relief and the ultimate objective of returning the Kurds to their homeland.¹⁸

Analysis. Due to the largely unforeseen mass migration,¹⁹ the speed at which the Joint Task Force was established led to a disjointed command and control. Disadvantaged from the onset, the "ad-hoc"²⁰ operations center encountered difficulties in setting the rhythm to effectively share information between its many components. A missed opportunity to gather information early in the operation was created by the inability to coordinate the efforts of the 50 humanitarian organizations already working in the region, although they would later be incorporated into the command structure.²¹ Additionally, the limited satellite and high frequency communications bandwidth impeded efforts to share critical information. Organized with two joint task forces (JTFs) working in different locations with different capabilities, provisions should have been made for information sharing. However, "there was a startling realization that there was no procedure for the two JTFs...and the supporting air arm...(or) various relief agencies to share information."²² Additionally, the operation brought to light that information

requirements to achieve success in humanitarian efforts are not the same as those for waging war and “planners must fuse their effort to understand the ...information that needs to be collected before and during the crises.”²³ Unfortunately, the operational stovepipes and lack of sharing information would foreshadow the catastrophic event of two US Air Force F-15 fighters shooting down two US Army Blackhawk Helicopters.²⁴

Logical Conclusions. Challenged from the start with little time to prepare, this operation was complicated by the misinterpretation of information requirements in an unfamiliar environment, interoperability problems, and an overall lack of strategy to link the dispersed information sources. However, it did confirm the need for cooperation between military and humanitarian organizations. Although, not initially prepared to leverage the value that these organizations brought to the operation, the military eventually adapted and brought these organizations into the fold.²⁵ Another valuable lesson was the need to have “deployable robust command and control capabilities”²⁶ to facilitate quick establishment of vital communication links. Likely, the hardest lesson learned in the years of this operation came from the fratricide incident, which cost 26 lives²⁷ and might have been avoided with more information exchange between friendly units operating in the same airspace. It was known by some, including the Airborne Warning and Control System that the helicopters were operating in the airspace. However, pertinent details on the helicopter flights were not included in the Air Tasking Order²⁸ - a common practice in the theater for helicopter operations.²⁹ Ultimately, the personnel who were most relevant in the information chain, the two F-15 pilots, were not informed, resulting in tragic consequences.

Operation Restore Hope – Somalia

Initially involved in Operation Restore Hope to provide humanitarian assistance for a nation consumed by clan violence after the ouster of Siad Barre regime,³⁰ the failed humanitarian efforts and resulting atrocities (over 300,000 reported deaths³¹) compelled the UN to take necessary actions to restore the peace. Under UN Security Resolution 794 passed in December 1992, the use of force was authorized.³²

Analysis. What resulted was a US-led urban operation in a low-tech physical environment that could not support a high tech force. In short, information flow between operational commanders and decentralized forces was greatly impeded. To complicate matters, a complex chain of command was established with little authority on the ground. Centralized decision authority was retained at the operational level facilitated by reliance on technology, such as facsimile of tactical level orders to CENTCOM.³³ However, with little signal intelligence available, operational intelligence flowed in reverse. The human intelligence collected by tactical units was forwarded to the combatant command via the in-theater operational commander to make decisions and then back down.³⁴ With a nearly non-existent national communication infrastructure, resulting in limited information-processing capability for subordinates in theater,³⁵ this arrangement of passing information before taking action resulted in significantly delayed execution.³⁶ The existing C4I³⁷ systems did more to detract from the decision-making process than to aid it.³⁸ It is worth mentioning that this operation occurred after Operation Desert Storm, where “the products of signal intelligence...imagery intelligence...and electronic intelligence...were of great value and reinforced operational reliance on electronic

collectors.”³⁹ However, this model would not work for Somalia – an operation other than war – no matter how much it was forced from the top.

Other information flow problems that plagued operations included “a plethora of competing information systems”⁴⁰ some which lacked interoperability, as well as properly trained personnel to operate them; and the over-classification of documents – specifically the “NOFORN” restriction, which meant critical, time-sensitive information could not be shared with coalition partners.⁴¹

Logical Conclusions. Operation Restore Hope is a good example of overconfidence in information technology systems accompanied by a lack of confidence in the skills of the people required to plan and execute the operational mission to achieve the desired end-state. The visibility presented by information technology (IT) has allowed the long-reach of commanders to interfere - unable to resist the urge to guide the actions of subordinates based on the information fed through IT systems - with execution of subordinates in the operational theater. Operation Restore Hope demonstrates the crutch IT systems can become for the commander –delaying execution due to the penchant for more information before a decision can be made.⁴² Another point that can be made from this operation is that in a low technology theater of operations, the IT capabilities that are used as lifelines in military operations may be severely limited. Therefore, preparation of the operating environment must include built in redundancies, not just in IT systems, but also ensuring personnel possess the proper skill sets and tools necessary to execute with limited communications from headquarters.⁴³ The initial guidance provided by the operational commander (in the absence of vital communication links used to direct the actions of deployed forces) may be the only information available

to subordinates during execution of mission. Therefore, it is critical that personnel have the mental agility to translate guidance into actions.⁴⁴ Other issues that warrant high concern included the tight control of mission essential information, as well as the lack of interoperability of systems, people, and processes, which will prove to be a recurring theme.

Operation Iraqi Freedom

With the overwhelming belief that Saddam Hussein posed a significant threat to the free world, Operation Iraqi Freedom was initiated “to disarm Iraq of weapons of mass destruction, to end Saddam Hussein’s support for terrorism, and to free the Iraqi people.”⁴⁵ IT played a significant role in the quick success of the operation through the Dominate phase of operations. “Coalition forces brought to bear the full power of megabits and gigabytes against regular, irregular and so-called elite forces of the Iraq military.”⁴⁶ No surprise, fighting conventional wars against nation states is exactly what the US and its partners are trained to do and one could argue no one does it better.

Analysis. However, the mission was not complete! Operation Iraqi Freedom has turned out to be more asymmetrical than conventional warfare, faced with the same challenges that often plague operations conducted in less than optimal environments. Limited interoperability with coalition partners proved to be a major obstacle, largely based on differences in capabilities. Instead of being able to leverage interoperable IT resources, such as NATO’s CENTRIX⁴⁷, to deliver time-dependent critical information, “CENTCOM had to rely on placing LNOs⁴⁸ with US-only C2 systems.”⁴⁹ Given a coalition is ad-hoc, it is understood that LNOs are extremely valuable assets. However, when working with allies, the idea that LNOs are required to serve as an interface

between allied forces and IT systems seems extremely low tech in a very high tech operational environment. This also raises the concern of operational security. If the LNO could pass the information to the coalition that was provided by the US-only C2 system, is it truly US-only? Often, things are done a certain way - in this case, security classifications - because that is always how it has been done. Reevaluating the process to identify possible changes that would close the gap to seamless integration may be considered too hard.

Another difficulty encountered at the operational level was how to effectively deliver “command and control on the move”.⁵⁰ As operations in the theater moved throughout the physical domain, it should go without saying that information flow must follow. Equipment interoperability proved to be the culprit.⁵¹

Lack of a common accessible database containing operationally relevant information on friendly and enemy forces also complicated operations. With over 300 databases to choose from, information consumers could not simply focus on determining relevant information based on that provided, but instead had to first determine which databases existed, which contained the information needed, and in some cases how to gain access, as there was no global authentication process in theater.⁵² Obviously with this structure, finding the right information required extensive effort and restricted information sharing.⁵³

Logical Conclusions. In the years that have passed since the previously mentioned operations, one would think that some of those same IM challenges would be mitigated in Operation Iraqi Freedom. This operation has again proven the case for the need for interoperability. In the globally connected world, where military actions of one state

undoubtedly will have an impact on many others, unilateral actions are likely a thing of the past. Hence, interoperability is an absolute must. It also emphasizes the need for continual review of processes by which information is shared with operational partners. Just because something worked in the past does not mean it is the most effective method for current or future operations. While it has been stated that “the theoretical superiority of network-centric warfare in conventional combat was realized with the rapid US-led coalition victory over Saddam Hussein’s forces”⁵⁴, one must be careful not to put total reliance on technology. A network centric operation is a good thing; however, it is built on IT systems and although often reliable, they can and will fail at the most inopportune time. Military operations are too important to rely totally on the operation of a single IT solution. Redundancy must be built into operations, not only in systems, but also in the knowledge, skills, and ability of personnel: so when systems fail, personnel have the tools to close the gap.

RECOMMENDATIONS

With so much emphasis in getting the right information to the right people, at the right time, guiding principles are a must. In a constantly changing global environment, effectiveness of an organization is dependent on the willingness to assess how it operates and the ability to effect necessary changes in order to meet new demands. The military is no different. While it will always be the force relied upon to protect the interests of the nation it serves, the nature of the threat it faces can and will change. Hence, DOD initiatives, such as Joint Vision 2020 and the Quadrennial Defense Review, acknowledge the need for transformation. Transformation to a large degree is propelled by a network-centric environment. Information and its importance in achieving an objective have

always existed; what has changed is the speed at which vast amounts of information can be delivered to the consumer. Consequently, information overload has and will continue to lead to confusion unless proper guidance can be derived to focus the actions of future endeavors.

The military has acknowledged the monumental significance of the net-centric environment in achieving information superiority. Information superiority can only be achieved by harnessing the power of the net-centric environment through effective IM. After all, the value added is not in the connectivity of the networks, but in the information it provides; information that must be accurate, relevant, and timely. The following is a list of recommended IM principles, not intended to be all-inclusive, but a good starting point for further study.

1. Operationally Focused – Intellectually Powered (Facilitated by IT)

“Success in information management is 5% technology and 95% psychology.”⁵⁵

The most difficult hurdle to overcome in IM is the perception that IM equates to IT. IM is less a function of information technology and more a dynamic process of the interaction of people and technology, which requires constant analysis and refinement to meet the commander’s information requirements and ultimately achieve information superiority. Often it is stated that IM is about getting “the right information, to the right people, at the right time.” However, it must be remembered that technology provides the means for speedy information flow, but is no substitute for the brainpower that is required to ensure the information delivered is operationally aligned with the needs of the end user. After all, delivering a properly packaged product that the consumer can put to immediate use to “reduce uncertainty”⁵⁶ in a given situation is the ultimate objective of

IM. This requires the human ability to think - the information producer must understand the information requirements as it relates to the operation, collect input from multiple sources, interpret information provided, and package in a usable format that will meet the user's needs; a lofty objective that will not be met by an IT solution alone.

Unfortunately, with the emphasis clearly on the systems, personnel "arenot learning how to reason within the ... networked environment"⁵⁷ Organizations must see IT for what it is, a facilitator of IM and place the focus of IM back where it belongs – alignment with operational requirements and the capabilities of its personnel.

2. Dynamic Process in Need of Constant Review

"The magic of command and control occurs when skilled and talented personnel interact with the system to make it really work – to turn ideas into action"⁵⁸

IM is defined in joint terminology as "the function of managing an organization's information resources by the handling of knowledge acquired by one or many different individuals and organizations in a way that optimizes access by all who have a share in that knowledge or a right to that knowledge."⁵⁹ But is IM truly a function or more a process that needs to be continually evaluated and reevaluated in order to achieve its objective? Function "implies a definite end or purpose that...a particular kind of work is intended to perform."⁶⁰ On the other hand, a process is "a continuing activity"⁶¹ which has a systematic approach that "emphasizes both measurability and improvement."⁶² Inherent in a process is feedback – a necessary attribute of any systematic process focused on improvement. It is easy to measure IM in terms of IT...time to deliver a message, authorized access, bandwidth requirements, number of times accessed, etc., all of which are critical measurements in IM. However, what about the not so easy to

retrieve statistics...usability, interpretation, confidence in source, best information retrieval methods, etc? How does one evaluate those metrics? The IM process must include feedback links between consumer and producer to inject necessary corrections into the system. It is important to identify the right metrics early on in the process, as they will serve as the triggers for corrections. If IM is to be leveraged to achieve information superiority, it must be viewed as a process and structured to quickly adapt to changes in the operational environment.

3. User Centered Through Clearly-Defined, Prioritized Information Requirements

“The foundation of any command and control system is actually the operational information being fed into it.”⁶³

Identifying information requirements is the first and likely the most important step in the IM process. The importance of clearly identified and prioritized information requirements cannot be overstated. One cannot deliver what one does not quite understand; nor can one cipher through the mounds of information to determine what is more important to the user without priorities. Identifying information requirements, is likely to be the most time-consuming part of the process but if this part is right, the return on investment will equate to reduced complexity in follow-on steps. Often so much focus is placed on the medium - the IT infrastructure - that the efforts required to attain the “right information” does not quite receive the attention it needs. In order to develop an effective IM strategy, the producers of information must first and foremost understand who the consumers are and how they operate. It is through that common understanding that the operational-minded producers will be able to assist the user in identifying and prioritizing the operational needs and seek out methods that most efficiently deliver the

user's information requirements. While it is not the producer's role to identify information requirements, there is much to be gained through cross-functional collaboration between consumer and producer in this very important step. It will enable the early identification of potential gaps in information and with proper planning, provide time to minimize risks through both operational processes and technological solutions.

4. Interoperable – Systems and Processes

“The teams and staff through which the modern commander absorbs information and exercises his authority must be a beautifully interlocked, smooth-working mechanism. Ideally the whole should be practically a single mind.” General Dwight D. Eisenhower⁶⁴

The requirement for interoperability should come as no surprise. In the current global environment, the military operations of one nation impact the diplomacy and economics of many other nations, and it is almost expected that such operations will be executed in coordination with other nations that share the same interest. However, this is another attribute that focuses mainly on IT systems. The perception seems to be that open architecture networks and open source programs will solve this issue. While extremely critical to interoperability, systems must not be the only concern. Challenges, such as lack of standardized terminology or common processes, which are in the way of achieving interoperability, can be addressed by the operational staff. Personnel must be trained to know and understand the capabilities and limitations of the diverse organizations participating in the joint or coalition environment if seamless operations are to be achieved. Upon deployment is not the best time to figure out what is not understood; the organization must plan ahead so personnel can be prepared to engage in coalition operations. Working to build a standard foundation before operations

commence enables personnel to spend less time acclimating to a joint environment and more time planning and executing. Efforts should also be focused on eliminating barriers to horizontal flow of information.⁶⁵ Command structure ensures that information flows from subordinate to superior and vice versa; but operational processes must also facilitate the exchange of information between the horizontal elements within the operation in an effort to create a shared understanding.

5. Optimum Security Balanced with Information Availability

“The mission of security is to give ... freedom of action.”⁶⁶

Protection of critical information should be of the utmost priority; but it must be balanced with ensuring information is available to coalition partners and others requiring access to that information in order to meet the operational objective. Security should not be so stringent that it becomes an obstacle for participating forces.⁶⁷ If operational partners are to be added value to the operation, they must have access to the information they need to effectively contribute. Security cannot be just about denying access to the enemy but must also consider the importance of information availability. A policy that essentially denies all non- US personnel access unless an exception is raised is much easier to manage; however, it impedes the mission. A much more effective process is taking the time to classify documents at the appropriate level, so only the information that absolutely cannot be shared is held back. Security in IM only provides freedom of action if it protects classified information while still providing access to information required to accomplish the tasks at hand. Any thing less is not optimum security. Unity of effort is built on the ability to share information, and security, if not properly implemented, will obstruct that effort.

CONCLUSION

There is no denying that the globally connected environment, with all its good attributes, has created an information quandary – so much information, often times it is difficult to distinguish the relevant from the irrelevant. In complex operational environment, information overload can quickly lead to confusion. To diminish this risk, an effective IM strategy must be adopted to focus efforts in the collecting, processing, and distributing of information. Review of past and current military operations strongly suggests that IM is not optimum in the operational environment. While some challenges in this paper must be addressed at a higher level of command, there are some issues that can be improved at the operational level. A well thought out, operationally aligned IM strategy based on solid guiding principles would facilitate a better shared understanding of what truly defines effective IM for the operational environment. Information Management is not Information Technology Management. Nor is it a simple function to be handled only by C4I system experts. Effective IM in the operational environment must be operationally focused and championed from the top down, as it is a determining factor in mission success.

Information superiority is about a decisive advantage that can only be obtained through the most effective management of information. An IM approach that can deliver accurate, relevant, timely information as expected must be focused by an overall strategy aligned to meet operational objectives. This will require a substantial amount of invested resources: not just money to fund IT systems, but more importantly an investment in people and processes. The bottom line is that information superiority envisioned in Joint Vision 2020 will never be realized without effective IM. Therefore, IM is far too

important to leave to chance. In the operational environment, the staff is responsible for staff work – planning to ensure mission success. In the globally networked environment in which there is more information available than one can effectively process, that implies development of an overarching information management strategy with guiding principles tailored to meet the information requirements of the operational environment.

NOTES

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- ¹ Milan N. Vego, *Operational Warfare* (Rhode Island: Naval War College, 2000), 97.
- ² Chairman, U.S. Joint Chiefs of Staff, Joint Vision 2020 (Washington, DC: CJCS, June 2000), 7.
- ³ Defined as the integrated employment of the core capabilities of electronic warfare, computer network operations, psychological operations, military deception, and operations security, in concert with specified supporting and related capabilities, to influence, disrupt, corrupt or usurp adversarial human and automated decision making while protecting our own. Chairman, U.S. Joint Chiefs of Staff, Joint Publication 1-02 (Washington, DC: CJCS, 12 April 2001 as amended through 22 March 2007), 259.
- ⁴ Chairman, U.S. Joint Chiefs of Staff, Joint Publication 1-02 (Washington, DC: CJCS, 12 April 2001 as amended through 22 March 2007), 260.
- ⁵ C.R. Brown, "The Principles of War," *U.S. Naval Institute Proceedings* 75, no.6 (June 1949): 621-633.
- ⁶ National Defense University, Joint Forces Staff College Publication 1 (Norfolk, VA: NDU, 2000), D-1.
- ⁷ Chairman, U.S. Joint Chiefs of Staff, Joint Publication 4-0 (Washington, DC: CJCS, 6 April 2000), II-1.
- ⁸ Chairman, U.S. Joint Chiefs of Staff, Joint Publication 3-07.3 (Washington, DC: CJCS, 12 Feb 1999), I-7.
- ⁹ U.S. President, Executive Order no. 12674 of April 12, 1989 (as modified by E.O. 12731), "Principles of Ethical Conduct for Government Officers and Employees," (17 October 1990).
- ¹⁰ Chairman, U.S. Joint Chiefs of Staff, Joint Publication 3-13 (Washington, DC: CJCS, 13 February 2006), I-6.
- ¹¹ Vego, *Operational Warfare*, 21.
- ¹² Intergovernmental organizations; defined in Joint Publication 1-02 as an organization created by a formal agreement between two or more governments. Examples include the United Nations, North Atlantic Treaty Organization, and the African Union. JP 1-02, 271.
- ¹³ Nongovernmental organizations; defined in Joint Publication 1-02 as private, self-governing, not-for-profit organization dedicated to alleviating human suffering; and/or promoting education, health care, economic development, environmental protection, human rights, and conflict resolution; and/or encouraging the establishment of democratic institutions and civil society. JP 1-02, 375.
- ¹⁴ Lawrence P. Farrell, "'Information Fusion' Key to Winning Wars." *National Defense* 88 no. 606 (May 2004), 4.
- ¹⁵ Gordon William Rudd, *Operation Provide Comfort: Humanitarian Intervention in Northern Iraq* (Ann Arbor, MI: University Microfilms International, 1994), 83.
- ¹⁶ Dawn R. Eflein, "A Case Study of Rules of Engagement in Joint Operations: The Air Force Shootdown of Army Helicopters in Operation Provide Comfort." *The Air Force Law Review* 44 (1998), 33.
- ¹⁷ Rudd, *Operation Provide Comfort*, 83.
- ¹⁸ Rudd, *Operation Provide Comfort*, 118.
- ¹⁹ Michael A. LeSavage, "*Operation Provide Comfort I*." (research paper, Newport, RI: U.S. Naval War College, Joint Military Operations, 2006), 5.
- ²⁰ Ibid, 5.
- ²¹ Ibid, 4 and 10.
- ²² Ibid, 11
- ²³ Ibid, 17
- ²⁴ Ibid, 18.
- ²⁵ Ibid, 10.
- ²⁶ Ibid, 10.
- ²⁷ Eflein, Case Study of Rules, 33.
- ²⁸ Defined in JP 1-02 as method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. JP 1-02, 29.
- ²⁹ Eflein, Case Study of Rules, 55.
- ³⁰ Gregory J. Borden, "Operational Decision to Execution Gaps in Operations Other Than War: Ceding the Information Initiative." (research paper, Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, 26 May 95), 21. . Available as Defense Technical Information Report (DTIC) ADA300243.

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- ³¹ Phillip, W. Boggs, "Joint Task Force Commanders and the "Three Block War": Setting the Conditions for Tactical Success," (research paper, Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, 15 May 2000), 27. Available as Defense Technical Information Report (DTIC) ADA383586.
- ³² Borden, Operational Decision to Execution, 22.
- ³³ Ibid, 28.
- ³⁴ Ibid, 28.
- ³⁵ Russell W Glenn and Gina Kingston, *Urban Battle Command in the 21st Century*. (Santa Monica, CA: RAND, 2005), 43.
- ³⁶ Borden, Operational Decision to Execution, 28.
- ³⁷ Command, Control, Communications, Computers, and Intelligence. JP 1-02, A-18.
- ³⁸ Borden, Operational Decision to Execution, 36.
- ³⁹ Borden, Operational Decision to Execution, 8-9.
- ⁴⁰ David L. Shelton, "Intelligence Lessons Known and Revealed During Operation Restore Hope Somalia," *Marine Corps Gazette* 79, no. 2 (Feb 1995): 37.
- ⁴¹ Ibid, 38.
- ⁴² Borden, Operational Decision to Execution, 8.
- ⁴³ Glenn and Kingston, *Urban Battle Command*, 32.
- ⁴⁴ Glenn and Kingston, *Urban Battle Command*, 32.
- ⁴⁵ U.S. President, President Discusses Beginning of Operation Iraqi Freedom. (Washington, DC: White House, 2002).
- ⁴⁶ Robert K. Ackerman, "Iraq War Operations Validate Hotly Debated Theories." *Signal*, July 2003, 31.
- ⁴⁷ Combined Enterprise Regional Information Exchange System. JP 1-02, A-23.
- ⁴⁸ Liaison officer. JP 1-02, A-83.
- ⁴⁹ Ackerman, Iraq War Operations, 34.
- ⁵⁰ Ackerman, Iraq War Operations, 34.
- ⁵¹ Ackerman, Iraq War Operations, 34.
- ⁵² John R Vines, "The XVIII Airborne Corps on the Ground in Iraq." *Military Review* 86, no. 5 (September/October 2006), 42-3.
- ⁵³ Vines, XVIII Airborne Corps, 44.
- ⁵⁴ Ackerman, Iraq War Operations, 31.
- ⁵⁵ Thomas H. Davenport, *Information Ecology: Mastering the Information and Knowledge Environment*. (New York, New York: Oxford University Press, 1997), 175.
- ⁵⁶ Davenport, *Information Ecology*, 116
- ⁵⁷ David C Gompert, Lachow Irving, and Justin Perkins. *Battle-Wise*. (Washington D.C.: National Defense University Press, 2006), p 4.
- ⁵⁸ Darren Knight. "The Fourth Wish: Operational Information Management and Situational Awareness." *Canadian Military Journal*. (Winter 2001-2002), 33 – 40.
- ⁵⁹ Chairman, U.S. Joint Chiefs of Staff, Joint Publication 1-02 (Washington, DC: CJCS, 12 April 2001 as amended through 22 March 2007), 259.
- ⁶⁰ *Merriam-Webster's Collegiate Dictionary*, 10th ed. (Springfield, MA: Merriam-Webster, 1998), 472.
- ⁶¹ *Merriam-Webster's Collegiate Dictionary*, 10th ed. (Springfield, MA: Merriam-Webster, 1998), 929.
- ⁶² Davenport, *Information Ecology*, 134-5.
- ⁶³ Knight, The Fourth Wish, 36.
- ⁶⁴ Dwight D. Eisenhower, General, U.S. Army, quoted in Russell W Glenn and Gina Kingston, *Urban Battle Command in the 21st Century*. (Santa Monica, CA: RAND, 2005), 9.
- ⁶⁵ Davenport, *Information Ecology*, 88.
- ⁶⁶ Brown, Principles of War, 630.
- ⁶⁷ Chairman, U.S. Joint Chiefs of Staff, Joint Military Operations Historical Collection. (Washington, DC: CJCS, 15 July 1997), III-10.

APPENDIX

Below are information management practices implemented in the aforementioned operations that were beneficial to the operating environment.

Operation Provide Comfort

Information sharing practices that proved to be beneficial in the precipitous terrain was the insertion of Special Operations Forces, who understood that gathering vital information about the environment and the people was an absolute preliminary step in the operations.¹ As well as the standup of the Military Coordination Center, whose “daily... communication with Iraqi military and civil authorities was successful in disseminating information vital to reducing conflict.”² This effort reinforced the notion that while IT systems are critical to operations, people are the most valuable assets, as systems simply do not have the capability to collect and process the human factors of the environment.

Operation Restore Hope

In summary, for all of its shortcomings, there were also effective implementations of information management practice in Operation Restore Hope. Particularly noteworthy, was the establishment of the Civil Military Operations Center, (CMOC). With over 30 humanitarian organizations already operating in Somalia with a less than mature infrastructure, CMOC served as the focal point to communicate and coordinate efforts of these organizations. However, more evolved from this effort than expected; collection of critical human intelligence helped to provide “up-to-the minute assessment,”

¹ Michael A. LeSavage, “*Operation Provide Comfort I.*”(research paper, Newport, RI: U.S. Naval War College, Joint Military Operations, 2006), 8.

²Ibid, 9.

which was leveraged to complement military operations in the region.³ Additionally, the Joint Information Bureau (JIB) was established as a coordination point for the more than 750 media representatives. This allowed controlled access to military operations and ensured the information disseminated to the public was reflective of the true situation.⁴ Additionally, reverting back to an old way of doing business, the JIB published a weekly newspaper to communicate with its dispersed subordinates⁵ – clearly an indication that the JIB understood the shortcomings of the environment.

Operation Iraqi Freedom

Success stories in information management during Iraqi Freedom were evident as well. Unmanned aerial vehicles were of much value to operations, providing the ability to gather information without putting personnel at risk. Commercially provided internet protocol services proved to be dependable, and the operation saw “the first major use of extremely high frequency satellite links.”⁶ Also, there was recognition by headquarters of the need to institute technical measures to limit the amount of irrelevant information fed to subordinates. As stated by General Moran, CENTCOM J6 “Just because you could know it because we had the technology, doesn’t mean that you should know it.”⁷

³ Chairman, U.S. Joint Chiefs of Staff, Joint Military Operations Historical Collection. (Washington, DC: CJCS, 15 July 1997), VI-3-4.

⁴ Phillip, W. Boggs, “Joint Task Force Commanders and the “Three Block War”: Setting the Conditions for Tactical Success,” (research paper, Fort Leavenworth, KS: U.S. Army Command and General Staff College, School of Advanced Military Studies, 15 May 2000), 37. Available as Defense Technical Information Report (DTIC) ADA383586.

⁵ Ibid, 37.

⁶ Robert K. Ackerman, “Iraq War Operations Validate Hotly Debated Theories.” *Signal*, July 2003, 33.

⁷ Ibid, 33.

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